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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/733,771

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Michael Cornelis Van Beek

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EXAMINER

GUTIERREZ, KEVIN C

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 07/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/733,771		VAN BEEK ET AL.	
	Examiner		Art Unit	
	Kevin Gutierrez		2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2-28-06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Remarks (pages 6-7), filed June 1, 2006, with respect to claims have been fully considered and are persuasive. The rejection(s) of the claims have been withdrawn.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6, 8-16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Somekh (6,427,703) in view of Ohtoshi et al. (5,539,211).

Regarding claims 1 and 14, Somekh discloses

- "a support structure (220) constructed to support a patterning structure (208), said patterning structure adapted to pattern a beam of radiation (203) according to a desired pattern;

- a substrate holder (212) constructed to hold a substrate (214);
- a projection system (210) customized and arranged to project the patterned beam onto a target portion of the substrate (214);

- a downstream radical source (216) with a gas supply configured to provide a beam of radicals directed onto a surface to be cleaned (col. 7, lines 19-21).

Somekh does not disclose a downstream radical source having a tube connected to a gas supply and “wherein the radicals are generated within a flow of gas from the gas supply in the tube.”

However, having a downstream radical source having a tube connected to a gas supply and wherein the radicals are generated within a flow of gas from the gas supply in the tube is known to the art as it is evident by the teaching of Ohtoshi et al. (Fig. 2, where radicals are generated by 2 within a flow of gas supplied by a source 3; col. 12, lines 13-14 and lines 47-50). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the downstream radical source of Somekh by including a tube for at least the purpose of mixing gas sources as suggested by Ohtoshi et al. (col. 12, lines 13-16).

Regarding claim 2, Somekh further discloses “wherein said beam of radicals contains substantially no ionized particles (col. 6, lines 25-29).”

Regarding claim 3, Somekh further discloses “wherein said gas supply (216), supplies at least one of oxygen, hydrogen, and fluorine (216).”

Regarding claim 4, Somekh further discloses “wherein said downstream radical source provides a beam of at least one of oxygen radicals, hydrogen radicals, and fluorine radicals (col. 6, lines 26-29).”

Regarding claim 5, Somekh further discloses “wherein said surface to be cleaned is on one of the patterning structure, a sensor, a lens, a detector, and a

reflector for reflecting one of the beam of radiation (203) and the patterned beam (col. 9, line 43 and lines 49-50).”

Regarding claim 6, Somekh further discloses “wherein the position of the downstream radical source is fixed (Fig. 2A, where 216 is connected to illumination chamber 204 and chamber 220 via nozzles (224 and 215).”

Regarding claim 8, Somekh further discloses “wherein the downstream radical source comprises at least one of an RF coil, a pair of DC discharge electrodes, a microwave cavity, and an RF cavity that generates a region of plasma within the flow of gas from the gas supply, the radicals being created in said plasma region (see col. 6, lines 39-43).”

Regarding claim 9, Somekh further discloses “wherein the downstream radical source comprises a high temperature element located within the flow of the gas from the gas supply, the temperature of the high temperature element being sufficient to cause thermal dissociation to create the radicals (col. 6, lines 39-43).”

Regarding claim 10, Somekh further discloses “an evacuated chamber (220) that contains the patterning structure (208), the substrate (214), and the projection system (210), wherein the downstream radical source comprises a tube (Figure 2C, 235; col. 7, lines 36-37), the beam of radicals are discharged from an end of said tube (Figure 2C, 235; col. 7, lines 36-37), and said end of the tube (Figure 2C, 235; col. 7, lines 36-37) is located in the evacuated chamber (220).”

Regarding claim 11, Somekh further discloses “wherein the region of the downstream radical source (216) in which the radicals are formed is located outside of the evacuated chamber (Figure 2C, 216 is located outside of 230).”

Regarding claim 12, Somekh further discloses “wherein the apparatus comprises at least two downstream radical sources and corresponding beams of radicals for cleaning said surface (col. 10, lines 30-34).”

Regarding claims 13 and 20, Somekh further discloses “wherein said surface to be cleaned comprises a surface of an optical element (see col. 3, lines 35-36).”

Regarding claim 15, Somekh further discloses the limitations set forth in claims 1 and 14. Somekh also further teaches “wherein said radical source (216) is disposed away from said radiation source (202) such that operating conditions of said radical source (216) do not adversely affect said beam of radiation (203).”

Regarding claim 16, Somekh further discloses “a plasma generator (col. 6, lines 38-41) to generate a plasma region, wherein gas from the gas supply (202) flows through the tube (Figure 2A) and through the plasma region such that neutral and ionized particles are created (col. 6, lines 26-29), and the beam of radicals exits the tube at an orifice (224) onto the surface to be cleaned (see col.7, lines 19-22).”

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh and Ohtoshi et al., as applied to claims 1 and 6, and in further view of Horiike et al (5,308,791).

Somekh teaches “a structure to direct said beam of radicals onto a surface to be cleaned (see col.7, lines 19-22).” Somekh does not teach wherein “said structure

Art Unit: 2851

comprising a device that moves a component containing said surface such that the beam of radicals is incident on said surface.”

However, having “said structure comprising a device that moves the component containing said surface such that the beam of radicals is incident on said surface” is known in the art as is evident to the teaching of Horiike et al (col. 5, lines 6-7 and lines 15-18). It would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify Somekh as modified by including a device to move the component containing the surface to be cleaned in the direction where the beam of radicals is incident on the surface.

The ordinary artisan would have been motivated to further modify Somekh as modified in a matter described above for at least the purpose to clean a specified portion of the surface.

5. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh in view of Ohtoshi et al., as applied to claims 15 and 16, and in further view of Sakai et al. (5,312,519).

Somekh as modified discloses the limitations set forth in the claims except “wherein walls of the tube neutralize the ionized particles.”

However, having “wherein walls of the tube neutralize the ionized particles” is known in the art as is evident to the teaching of Sakai et al (col. 2, lines 49-51; col. 3, lines 49-51). Thus, it would have been obvious to one ordinary skilled in the art at

the time the invention was made to further modify Somekh as modified by including a discharge tube to neutralize the ionize particles.

The ordinary artisan would have been motivated to further modify Somekh as modified to utilize a discharge tube to provide a more uniform stream of neutralized ion particles.

6. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh in view of Ohtoshi et al., as applied to claims 15 and 16, and in further view of Vane (6,105,589).

Somekh as modified discloses the limitations set forth in claims except (claim 18) “wherein a Faraday grid neutralizes the ionized particles” and (claim 19) “wherein the Faraday grid is disposed at the orifice of the tube.”

However, having “wherein a Faraday grid neutralizes the ionized particles” and “wherein the Faraday grid is disposed at the orifice of the tube” is known in the art as is evident to the teaching of Vane (col. 7, lines 62-65). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify Somekh as modified by including a Faraday grid located at the opening of a tube to neutralizes ionized particles.

The ordinary artisan would have been motivated to further modify Somekh as modified for at least the purpose to provide a more uniform stream of neutralized ion particles.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following disclose a radical-particle generator of a gas supply: Koster et al. (6,614,505), Sakai et al. (5,466,942), and Ooah et al. (5,981,960).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Gutierrez whose telephone number is (571)-272-5922. The examiner can normally be reached on Monday-Friday: 7:30 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2851

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kevin Gutierrez
Examiner
Art Unit 2851

July 18, 2006

Rodney Fuller
Primary Examiner

A handwritten signature in black ink, appearing to read 'R. Fuller', with a stylized flourish at the end.